Bay Area Air Quality Management District

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Permit Evaluation
and
Statement of Basis
for
RENEWAL of

MAJOR FACILITY REVIEW PERMIT

for

City of Santa Clara, Electric Department
Facility #A0621

Facility Address:
524 Robert Avenue
Santa Clara, CA 95050

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Application Engineer: Madhav Patil
Site Engineer: Madhav Patil

Application: 28364

September 2017

TABLE OF CONTENTS

Title V Statement of Basis

A. Background

The City of Santa Clara, Electric Department is a major facility subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Title 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, "Major Facility Review". It is a major facility because it has the "potential to emit," (PTE) of more than 100 tons per year of a regulated air pollutant, carbon monoxide. It is not a major source of greenhouse gases. PTE is defined in BAAQMD Rule 2-6-218.

Major Facility Operating permits (Title V permits) must meet federal specifications, which are set forth in 40 CFR Part 70 and incorporated in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements for that facility. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. Some of these requirements are federally enforceable and others are not federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is A0621.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are still valid and correct. This review included an analysis of applicability determinations for all sources, including those that have been modified or permitted since the issuance of the initial Major Facility Review Permit. The review also included an assessment of all monitoring in the permit for sufficiency to determine compliance.

This facility received its initial Title V permit on March 22, 2000. The permit was renewed on May 23, 2012. This application for permit renewal was submitted by the City of Santa Clara on Nov 11, 2016. The current permit expired on May 22, 2017, but all of its provisions will remain in effect until the District takes final action on the permit renewal. The Facility has not added any equipment since the original issuance nor has it proposed any changes to the permit. However, the District has updated the permit to incorporate current BAAQMD regulations, requirements and standards and if applicable, has corrected the errors. Deletions in the permit are clearly shown in strikeout format and new language is underlined.

B. Facility Description

The primary business of the City of Santa Clara, Electric Department is the production of steam and electricity at the Cogeneration Plant Facility. The facility consists of two Allison 501-KB Combustion Turbines (S-1, S-2) used to drive two 3-phase 3.5 MW electric generators. Waste heat from the turbines is supplied to two Heat Recovery Steam Generators, the steam from which

is sold to an adjoining industrial customer, California Paperboard. The Supplemental Duct Burners (S-3, S-4) provide additional steam when needed.

In 2012, the facility declared that the emissions for the previous year were as follows:

Pollutant	Emissions
Particulate	5.34 tpy
Precursor Organics	19.7 tpy
NOx	57.2 tpy
SO2	0.218 tpy
CO	43.8 tpy
Benzene	0.0183 tpy
Formaldehyde	3.72 tpy

In 2016, the facility declared that the emissions for the previous year were as follows:

Pollutant	Emissions
Particulate	5.49 tpy
Precursor Organics	16.6 tpy
NOx	59.1 tpy
SO2	0.223 tpy
CO	45.3 tpy
Benzene	0.0182 tpy
Formaldehyde	3.85 tpy

These variations between 2012 and 2016 are indicative of normal variations in throughput. The District considers that the facility has not had a significant increase or decrease in its emissions since the renewal of the Title V permit in 2012.

Greenhouse gases (GHG) became regulated air pollutants for the purposes of the Title V permit on January 2, 2011. While the facility is a source of GHG, it is not a major source of GHG, which is a source that has a potential to emit of 100,000 CO2e (carbon dioxide equivalents) per year.

The potential to emit GHG is calculated as follows. The GHG emissions in this case are based on the combustion emissions. The emission factors for natural gas are found in 40 CFR 98, Tables C-1 and C-2. They are:

CO2:	117 lb/MMbtu
CH4:	0.0022 lb/MMbtu
N2O:	0.00022 lb/MMbtu

The facility capacity is 150.2 MMbtu/hr. The potential to emit for each GHG pollutant if the plant were to operate at full capacity for 8,760 hr/yr is:

CO2:	76,972 tpy
CH4:	1.45 tpy
N2O:	0.145 tpy

The CH4 and N2O masses are multiplied by the following factors found in 40 CFR 98, Table A-1 because their effect on global warming is higher that the effect of CO2 on global warming. The resulting number is the CO2e (carbon dioxide equivalents) number.

	Global Warming Potential Factor	CO2e
CH4:	25	36.25 tpy
N2O:	298	43.21 tpy

The total CO2e, adding CO2, CH4, and N2O is 77,052 tons per year.

Relationship with California Paperboard

The owner/operator for the facility has stated that it exists to produce steam for California Paperboard. Plant 621 is located adjacent to California Paperboard. Steam lines run from Plant 621 to Plant 9010. Because Plant 621 appeared to be a support facility for Plant 9010, the District investigated the relationship between the two plants.

Support facilities can be considered part of a primary facility under certain circumstances. If California Paperboard was part of the facility, or vice versa, it would be considered part of a major facility and would be required to apply for a Major Facility Review permit. It could be subject to more onerous offset requirements and it could be subject to the Federal Prevention of Significant Deterioration program.

Following is an analysis of the issue.

In brief, the facts here are as follows. Pursuant to a contract, California Paperboard purchases steam from the facility. The steam is delivered via a steam pipe that connects the two operations. California Paperboard purchases its power from the grid, which is operated by the City of Santa Clara - Silicon Valley Power and which receives power from numerous sources, including this facility. There is no direct access to power for California Paperboard from this facility. California Paperboard has the capability to produce steam on its own, but chooses to purchase it from City of Santa Clara.

At present, California Paperboard purchases approximately 65-70% of the steam produced by the City of Santa Clara, the remaining 30% of steam is wasted. Also, at present, the City of Santa Clara uses approximately 59% of the natural gas it purchases to create electricity, and 41% of the gas to produce steam.

California Paperboard and the facility share no employees, directors, shareholders or other ownership. They share no administrative functions. City of Santa Clara-Electric Department is a department of the City of Santa Clara. California Paperboard and the facility each are responsible for their own air pollution control equipment and liabilities. City of Santa Clara's employees have made statements to the effect that it would not be located in its present location "but for" the fact that California Paperboard is located next door and that if California Paperboard ceased to exist so would this cogeneration facility.

The PSD, Title V, and District 2-6-206 regulations define "Facility" as follows:

1) located on contiguous or adjacent property;
2) under common control; and

3) belonging to the same "industrial grouping."

Each factor must be met for California Paperboard and this facility to be considered the same facility or major source. EPA guidance has expanded on the third factor, whether the sources belong to the same industrial grouping, providing that a "support facility," one that typically conveys, stores, or otherwise assists in the production of the principle product should be considered part of the same source classification as the primary facility and thus satisfy the belonging to the same industrial grouping factor.

Here, the first factor is clearly met. California Paperboard and City of Santa Clara are located on adjacent properties, though they are not co-located. The third factor is also probably met, under the support facility test. This City of Santa Clara facility is likely a support facility for California Paperboard. It is not necessary to thoroughly analyze the third factor, however, because the second factor is not met.

California Paperboard and the facility are not under common control. Common control most typically exists when there is some form of corporate relationship between the two sources at issue. Here, California Paperboard is privately owned and City of Santa Clara is publicly owned; there is no corporate relationship. Absent a corporate relationship, EPA guidance states that there is a presumption of common control when one company locates on another's land. *See* Letter to Peter R. Hamlin from William A. Spratlin, September 18, 1995. Although City of Santa Clara is not located on California Paperboard's land, the analysis one would undertake on the presumption is instructive here. To overcome the presumption, one must examine how the companion facilities interact with one another, considering factors such as (1) do the facilities share a common workforce, security force, officers, board members; (2) do the facilities share equipment, other property, or pollution control equipment and what does the contract specify with regard to pollution control responsibilities of the contractee; (3) do the facilities share payroll, benefits, or other administrative functions; (4) do the facilities share intermediates, products, byproducts or other manufacturing equipment and can the new facility purchase raw materials and sell products or byproducts to other customers; (5) who accepts responsibility for compliance with air quality control requirements; (6) what is the dependency of one facility on the other, if one shuts down, what are the limitations on the other to pursue outside business interests; (7) does one operation support the other? These are screening questions; if the facilities respond in positive to one of the major indicators of control (management structures, plant managers, payroll, and other administrative functions), then there is most likely common control.

Here, not only are the facilities not located on the same land, but also none of the major indicators of control are present. The facilities do not share a common workforce, administrative functions, management or equipment (beyond the steam distribution equipment). While the facilities support one another, there is no dependency. If one shuts down, the other can still function and is free to pursue outside business interests. California Paperboard and City of Santa Clara are each responsible separately for compliance with air regulations. Thus, the Spratlin letter factors support a conclusion that there is no common control here.

Additional EPA letters on common control were reviewed, and in those that are most similar to the fact pattern here no common control was found. Without common control, the 3-part test to

establish that two facilities should be treated as one is not met and thus the District has determined that the two plants are two separate facilities.

C. Permit Content

The permit includes a section entitled Permit Content, which contains eleven sections, listed by roman numeral, that set forth the permit conditions, requirements and standards. A summary of the legal and factual basis for the permit's contents follows. The summary discusses each of the permit's sections in the same order as they are presented in the permit. Changes to the standard permit text have been made since the last renewal of the Title V Permit for this site was issued. These changes are reflected in the new proposed permit in strikeout/underline format.

I. Standard Conditions

This section contains administrative requirements and conditions that apply to all permitted facilities. Facility must also comply with Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or with the accidental release (40 CFR § 68) programs, this Section will include a standard condition pertaining to these programs. Many of the standards conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1, "General Provisions", and Regulation 2, "Permits".

Changes to permit:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated.
- District address is updated to current location.

II. Equipment

This section of the permit lists all of the facility's permitted and significant sources. Each source is identified by an S and a number (e.g., S-24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302. The Facility has four permitted sources.

BAAQMD Rule 2-6-239 defines "significant sources" as those sources that have a PTE more than 2 tons per year of a "regulated air pollutant," as defined in BAAQMD Rule 2-6-222, or 400 pounds per year of a "hazardous air pollutant," as defined in BAAQMD Rule 2-6-210. This facility has no significant sources that are not otherwise permitted.

The Equipment Section is part of the facility description. This Section contains information necessary for applicability determinations, such as fuel types and contents or sizes of tanks. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with State law and the District's regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and BAAQMD Regulation 2-1-403. An exceedance of any of these capacities is a violation of BAAQMD Regulations.

The facility consists of two Allison 501-KB Combustion Turbines (S-1, S-2) used to drive two 3-phase 3.5 MW electric generators. Waste heat from the turbines is supplied to two Heat Recovery Steam Generators, the steam from which is sold to an adjoining industrial customer, California Paperboard. The Supplemental Duct Burners (S-3, S-4) provide additional steam when needed.

Changes to permit:
None.

III. Generally Applicable Requirements

This section of the permit lists requirements that generally apply to all sources at a facility, including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, this Section includes standards that apply to sources that are insignificant or that do not require a permit to operate at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Changes to permit:
Table III has been updated to add rules and requirements to conform to the current District standard. Generally applicable requirements that were excluded inadvertently in the initial Title V permit were added.

- EPA Regulation 40 CFR 82: Protection of Stratospheric Ozone
- Subpart F, 40 CFR 82.156: Recycling and Emissions Reductions – Required Practices
- Subpart F, 40 CFR 82.161: Recycling and Emission Reductions – Technician Certification
- Subpart F, 40 CFR 82.166: Recycling and Emissions Reductions – Reporting and Recordkeeping Requirements.

The following generally applicable requirements that are not applicable were removed

- BAAQMD Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants.
- BAAQMD Regulation 8, Rule 16, Organic Compounds – Solvent Cleaning Operations
- BAAQMD Regulation 11 Rule 1, Hazardous Pollutants – Lead
- SIP Regulation 11, Rule 1, Hazardous Pollutants - Lead

The dates of adoption or approval of the rules and their "federal enforceability" status in Table III have been updated.

IV. Source-Specific Applicable Requirements

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

1. District Rules
2. SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are "federally enforceable" and a "Y" (yes) indication will appear in the "Federally Enforceable" column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the "Federally Enforceable" column will have a "Y" for "yes". If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
3. Other District requirements, such as the Manual of Procedures, as appropriate.
4. Federal requirements (other than SIP provisions)
5. BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
6. Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations of the applicable requirements for each source. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

Complex Applicability Determinations

Combined Emissions

Exhaust gases from the Gas Turbines S-1 and S-2 are combined with those from the Duct Burners S-3 and S-4 (e.g. S-1/S-3 and S-2/S-4) and cannot be separated when determining compliance with individual emissions limits. In accordance with BAAQMD Regulation 1-107, such combined emissions shall be subject to the most stringent applicable limitations and requirements. Because of this determination, the applicable requirements for the Duct Burners are largely the same as those for the Gas Turbines.

NSPS and Determination of NSPS NOx Limit

Per Section 60.330, the turbines are subject to 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, because they were built after October 3, 1977 and the capacity of each turbine is larger than 10 MMBtu/hr.

Per Section 60.4305, the turbines are not subject to 40 CFR 60, Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, because they were built before February 18, 2005.

The NOx limit (STD) in Subpart GG is determined by the following equation:

$$STD = 0.0150 \frac{(14.4)}{Y} + \text{NOx \% by volume @ 15\% excess oxygen (dry)}$$

where:

Y = manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt-hour). The value of Y shall not exceed 14.4 kilojoules per watt-hour.

The Gas Turbines S-1 and S-2 each have a rated heat input of 55.1 MMBTU/hr (58,086,420 kilojoules/hr) and a rated peak load of 3,800,000 watts. Therefore, for S-1 and S-2, Y = 15.29 kilojoules per watt-hour. Since the actual value of Y exceeds 14.4, the default value of 14.4 must be used. STD then equals 0.0150 % (equivalent to 150 ppmv) @ 15% O_2 (dry).

As per permit condition #14194, Part 5, NOx is limited to 42 ppmv @ 15% O_2. City of Santa Clara conducts annual source test to verify compliance with condition #14194 and 40 CFR 60, Subpart GG. Results from 2016, source test shows an average of 40.7 ppmv @ 15% O_2 for NOx emissions. Therefore, turbines at City of Santa Clara are in compliance with permit condition 14194 and 40 CFR 60, Subpart GG.

The SO2 limit is the same for all turbines. NSPS Subpart GG only has NOx and SO2 standards.

Acid Rain

In accordance with 40 CFR 72.6 (b)(2) the facility is not subject to the requirements of 40 CFR 72 "Acid Rain Program" because the power generation units commenced commercial operation prior to November 15, 1990 and they have nameplate capacities below 25 MWe.

NESHAP for Stationary Combustion Turbines

The Gas Turbines S-1 and S-2 are not subject to 40 CFR 63 Subpart YYYY "National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines" because the facility is not a major source of hazardous air pollutants (HAPs).

40 CFR 64, Compliance Assurance Monitoring (CAM)

The applicability of CAM must be considered because S-1 and S-2, Turbines, have water injection for NOx control, which is considered a control device by the regulation, and the turbines also have federally enforceable NOx limits. The standard applies for each source that has a pre-control potential to emit that is higher than the major source threshold, which is 100 tons per year for NOx in the Bay Area. The potential to emit for each turbine is less than the threshold as shown in the calculation below. The turbines have a capacity of 55.1 MMBtu/hr. The uncontrolled emission factor is 0.32 lb NOx/MMBtu, from Table 3.1.1 in AP-42 Chapter 3.1. The turbines can run 8760 hours per year.

55.1 MMBtu/hr x 8760 hr/yr x 0.32 lb NOx/MMBtu x 1 ton/2000 lb = 77.2 ton/yr

Since the uncontrolled emissions of NOx are less than 77.2 tons/yr at each turbine, the turbines are not subject to CAM.

Changes to permit:

- Dates of adoption or approval of the rules and their "federal enforceability" status in Table IV-A have been updated.
- Permit condition Part 10 and 11 have been renamed to Part 11 and 12, respectively.
- Added SIP Regulation 9, Rule 1, Limitations on Ground Level Concentrations.
- Added SIP Regulation 9, Rule 1, General Emissions Limitation.

V. Schedule of Compliance

All major facility review permits must include a schedule of compliance. BAAQMD Rule 2-6-409.10 requires the schedule of compliance to contain the following elements:

10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;

10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and

10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted."

Based on available information, the District has determined that the facility is in compliance with all applicable requirements. Therefore, the permit's schedule of compliance contains the provisions set forth in Regulations 2-6-409.10.1 and 2-6-409.10.2 only.

Changes to permit:
None

VI. Permit Conditions

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting has been added to the permit.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in the proposed permit. Subject to consideration of comments received, the final permit will include all underlined language. The struck language will have been deleted.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or

revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Major Facility Review permit renewal, permit conditions may be revised, in accordance with the procedures set forth in Regulation 2, Rule 6, Major Facility Review.

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO that limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- **PSD:** This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- **TRMP:** This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy.

Changes to permit:
None

VII. Applicable Limits and Compliance Monitoring Requirements

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District imposes monitoring requirements that are necessary to assure the facilities meet their applicable emissions limits. The District establishes the monitoring requirements for facilities' initial permits and renewal permits based on a balancing of several different factors including, but not limited to: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

As noted above, evaluation of this permit renewal's monitoring requirements is based on the same factors that were applied by the District in developing monitoring for applicable requirements**.** It follows that, although Title V calls for a re-examination of all monitoring**,** there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation**.** Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. Therefore, the District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate**.**

Particulate Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
GAS TURBINES W/WATER INJECTION: S1, S2	BAAQMD Regulation 6-1-301 and SIP Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-1-310 and SIP Regulation 6-310	0.15 gr/dscf	None
	BAAQMD Regulation 6-1-310.3 and SIP Regulation 6-310.3	0.15 gr/dscf @ 6% O2	None
DUCT BURNERS: S3, S4	BAAQMD Regulation 6-1-301 and SIP Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-1-310 and SIP Regulation 6-310	0.15 gr/dscf	None
	BAAQMD Regulation 6-1-310.3 and SIP Regulation 6-310.3	0.15 gr/dscf @ 6% O2	None

PM Discussion:

S1, S2: Gas Turbines; 55.1 MMBTU/hr, Natural Gas Fired

The Gas Turbines S1 and S2 are required by a federally enforceable permit condition to fire only natural gas. Because visible emissions are not normally associated with proper natural gas combustion, periodic monitoring for Ringelmann limits would not be appropriate for the turbines.

BAAQMD Regulation 6-1-310.3 limits PM emissions from "heat transfer operations" to 0.15 gr/dscf @ 6% O2. This compares to a PM10 factor of 0.0047 lb/MMBTU from AP-42 Table 3.1-2a "Emission Factors for Large Uncontrolled Gas Turbines". For a typical

natural gas fuel with a gross heating value of 1020 BTU/scf at 60-degree F, 0.15 gr/dscf @ 6% O2 can be converted to lb/MMscf (natural gas fired) as follows:

From 40 CFR 60, Appendix A, Method 19, the stoichiometric dry natural gas combustion factor of 8710 dscf (combustion products)/MMBtu (natural gas) can be derived from Table 19-2. At 6% excess O_2, this factor becomes:

(8710 dscf/MMBtu) x (1020 Btu/scf) = 8,884,200 dscf/MMscf
8,884,200 dscf/MMscf/10^6 scf/MMscf= 8.8842 dscf/scf
8.8842 dscf/scf x [20%/(20% - 6%)] = 12.692 dscf/scf

Therefore, the conversion of 0.15 gr/dscf @ 6% O_2 to lb/MMBtu is:

(12.692 dscf/scf) x (0.15 gr/dscf) x (lb/7000 gr) x (1,000,000 scf/MMscf)

= 272 lb/MMscf
= 272 lb/MMscf / 1020 Btu/scf
= 0.267lb/MMBTU

Since this factor is so far above the AP-42 factor of 0.0047 lb/MMBTU, the addition of periodic monitoring to demonstrate compliance with this limit would not be appropriate.

S3, S4: Duct Burners; 20 MMBTU/hr, Natural Gas Fired

The case for not monitoring particulate emissions from the duct burners is the same as discussed for the Gas Turbines; natural gas combustion does not produce visible emissions, and the AP-42 emission factor is far below the Regulation 6-1-310.3 standard. EPA AP-42 Table 1.4-2 "Emission Factors For Particulate Matter (PM) From Natural Gas Combustion" in boilers and furnaces lists a PM emission factor of 7.6 lb/MMscf. This is well below the converted Regulation 6-1-310.3 standard of 272 lb/MMscf.

SO2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
GAS TURBINES W/WATER INJECTION: S1, S2	BAAQMD 9-1-301 and SIP 9-1-301	Ground level concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD 9-1-302 and SIP 9-1-302	300 ppm (dry) general emission limitation	None
	40 CFR 60 Subpart GG 60.333 (b)	0.8% (wt.) fuel sulfur content	None

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
DUCT BURNERS: S3, S4	BAAQMD Regulation 9-1-301 and SIP 9-1-301	Ground level concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD 9-1-302 and SIP 9-1-302	300 ppm (dry) general emission limitation	None

SO2 Discussion:

S1, S2: Gas Turbines; 55.1 MMBTU/hr, Natural Gas Fired
S3, S4: Duct Burners; 20 MMBTU/hr, Natural Gas Fired

BAAQMD Condition #14194, part 1 requires PUC grade natural gas to be used at all combustion sources at the facility. PUC standard natural gas can have no more than 5 grains total sulfur per 100 standard cubic feet (86 ppm, 0.0086% by weight). In accordance with 40 CFR 60.334(h)(3)(i), gaseous fuel sulfur monitoring is not required if the gas quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel show that the fuel has a sulfur content equal to or less than 20 grains total sulfur per 100 standard cubic feet. Therefore, the exclusive use of PUC standard gas will eliminate the need to monitor fuel sulfur content for 40 CFR 60 Subpart GG.

BAAQMD Regulation 9-1-301

Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO2 and therefore is not required to have ground level monitoring by the APCO.

BAAQMD Regulation 9-1-302

All natural gas combustion sources at the facility are subject to the 300 ppm (dry) SO2 emission limit in District Regulation 9-1-302. In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with BAAQMD Regulation 9-1-302, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
GAS TURBINES W/WATER INJECTION: S1, S2 **DUCT BURNERS:** S3, S4	BAAQMD 9-9-301.1, 9-9-301.2, and SIP 9-9-301.1	42 ppmv @ 15% O_2 (dry)	Annual source test, water-to-fuel monitoring
	NSPS Subpart GG 60.332 (a)(2)	150 ppmv @15% O_2 (dry)	water-to-fuel monitoring
	Condition #14194, parts 4, 5	42 ppmv @ 15% O_2 (dry)	Annual source test, water-to-fuel monitoring

The turbines are subject to continuous water-to-fuel monitoring, which is appropriate monitoring for this size of turbine.

Compliance with the NOx limit is also verified with annual source testing. A survey of the results since 2005 shows compliance with the NOx limits during testing.

Changes to permit:
None

VIII. Test Methods

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. The test methods are not applicable requirements, unless a rule or permit condition requires such ongoing testing, in which case the requirement will also appear in Section IV of the permit.

Changes to permit:
None

IX. Permit Shield

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits.

This facility has no permit shields.

X. Revision History

This section contains the details of issuance and revisions for each permit.

Changes in this action

The revision history section was updated. Application numbers have been added.

XI. Glossary

This section contains terms that may be unfamiliar to the general public or EPA.

Changes in this action

There are no changes proposed for this section.

D. Alternate Operating Scenarios:

No Alternate Operating Scenario was requested for this facility.

E. Compliance Status:

The responsible official for A0621 submitted a signed Certification Statement form dated, October 25, 2016. On this form, the responsible official certified that the following four statements are true:

Based on information and belief formed after reasonable inquiry, the sources identified in the Applicable Requirements and Compliance Summary form that are in compliance will continue to comply with the applicable requirements;

Based on information and belief formed after reasonable inquiry, the sources identified in the Applicable Requirements and Compliance Summary form will comply with future-effective applicable requirements, on a timely basis;

Based on information and belief formed after reasonable inquiry, information on application forms, all accompanying reports, and other required certifications is true, accurate, and complete;

All fees required by Regulation 3, including Schedule P have been paid.

F. Differences between the Application and the Proposed Permit:

The City of Santa Clara submitted its Title V permit renewal application on November 7, 2016. That version is the basis for conditions, terms, and requirements of the proposed Major Facility Review permit. All differences between the Facility's application and the proposed permit have been discussed in this Statement of Basis.

APPENDIX A

GLOSSARY

ACT
Federal Clean Air Act

APCO
Air Pollution Control Officer

API
American Petroleum Institute

AP-42
EPA publication: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources

ARB
Air Resources Board

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

BARCT
Best Available Retrofit Control Technology

C5
An Organic chemical compound with five carbon atoms

C6
An Organic chemical compound with six carbon atoms

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAPCOA
California Air Pollution Control Officers Association

CEC
California Energy Commission

CEQA
California Environmental Quality Act

CEM
A "continuous emission monitor" is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NOx concentration) in an exhaust stream.

CFR
The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

CO
Carbon Monoxide

CO2
Carbon Dioxide

Cumulative Increase
The sum of permitted emissions from each new or modified source since a specified date. Used to determine whether threshold-based requirements are triggered.

District
The Bay Area Air Quality Management District

dscf
Dry Standard Cubic Feet

dscm
Dry Standard Cubic Meter

E 6, E 9, E 12
Very large or very small number values are commonly expressed in a form called scientific notation, which consists of a decimal part multiplied by 10 raised to some power. For example, 4.53 E 6 equals (4.53) x (10^6) = (4.53) x (10 x 10 x 10 x 10 x 10 x 10) = 4,530,000. Scientific notation is used to express large or small numbers without writing out long strings of zeros.

EGT
Exhaust Gas Temperature

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District Regulations.

FE, Federally Enforceable
All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60, (NSPS), Part 61, (NESHAPs), Part 63 (HAP), and Part 72 (Permits Regulation, Acid Rain), and also including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

FP
Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

FR
Federal Register

GDF
Gasoline Dispensing Facility

GLC
Ground level concentration.

GLM
Ground Level Monitor

grains
1/7000 of a pound

HAP
Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by both 40 CFR Part 63, and District Regulation 2, Rule 5.

H2S
Hydrogen Sulfide

HHV
Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60F and all water vapor is condensed to liquid.

LHV
Lower Heating Value. Similar to the higher heating value (see HHV) except that the water produced by the combustion is not condensed but retained as vapor at 60F.

Major Facility
A facility with potential emissions of regulated air pollutants greater than or equal to 100 tons per year, greater than or equal to 10 tons per year of any single hazardous air pollutant, and/or greater than or equal to 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity as determined by the EPA administrator.

MFR
Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Act and implemented by District Regulation 2, Rule 6.

MOP
The District's Manual of Procedures.

MSDS
Material Safety Data Sheet

MW
Megawatts

NA
Not Applicable

NAAQS
National Ambient Air Quality Standards

NESHAPs
National Emission Standards for Hazardous Air Pollutants. Contained in 40 CFR Part 61.

NMHC
Non-methane Hydrocarbons

NMOC
Non-methane Organic Compounds (Same as NMHC)

NOx
Oxides of nitrogen.

NSPS
Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Act, and implemented by both 40 CFR Part 60 and District Regulation 10.

NSR
New Source Review. A federal program for pre-construction review and permitting of new and modified sources of air pollutants for which the District is classified "non-attainment". Mandated by Title I of the Clean Air Act and implemented by 40 CFR Parts 51 and 52 as well as District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

O2
The chemical name for naturally-occurring oxygen gas.

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio for the emissions from a new or modified source and any pre-existing cumulative increase minus any onsite contemporaneous emission reduction credits. Applies to emissions of POC, NOx, PM10, and SO2.

Phase II Acid Rain Facility
A facility that generates electricity for sale through fossil-fuel combustion and by certain other characteristics (defined in Regulation 2, Rule 6) is subject to Titles IV and V of the Clean Air Act.

POC
Precursor Organic Compounds

PM

Total Particulate Matter

PM10
Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

PSD
Prevention of Significant Deterioration. A federal program for permitting new and modified sources of air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

SCR
A "selective catalytic reduction" unit is an abatement device that reduces NOx concentrations in the exhaust stream of a combustion device. SCRs utilize a catalyst, which operates at a specific temperature range, and injected ammonia to promote the conversion of NOx compounds to nitrogen gas.

SIP
State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

SO2
Sulfur dioxide

SO2 Bubble
An SO2 bubble is an overall cap on the SO2 emissions from a defined group of sources, or from an entire facility. SO2 bubbles are sometimes used at refineries because combustion sources are typically fired entirely or in part by "refinery fuel gas" (RFG), a waste gas product from refining operations. Thus, total SO2 emissions may be conveniently quantified by monitoring the total amount of RFG that is consumed, and the concentration of H2S and other sulfur compounds in the RFG.

SO3
Sulfur trioxide

THC
Total Hydrocarbons (NMHC + Methane)

therm
100,000 British Thermal Unit

Title V
Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

TOC
Total Organic Compounds (NMOC + Methane, Same as THC)

TRMP
Toxic Risk Management Plan

TSP
Total Suspended Particulate

TVP
True Vapor Pressure

VOC
Volatile Organic Compounds

Units of Measure:

bhp	=	brake-horsepower
Btu	=	British Thermal Unit
g	=	grams
gal	=	gallon
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m^2	=	square meter
min	=	minute
MM	=	million
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year

Symbols:

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to